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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/992,784	11-06/2001	John Robert Lockemeyer	TH1396N (US)	6996

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EXAMINER

ILDEBRANDO, CHRISTINA A

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 05/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,784

Applicant(s)

LOCKEMEYER, JOHN ROBERT

Examiner

Christina Ildebrando

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 50-53 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-49, in Paper No. 6 is acknowledged. The traversal is on the ground(s) that search and examination of the entire application would not result in a burden of search. This is not found persuasive because the search required for Group I is not required for Group II, and vice versa. Therefore, search and examination of the entire application could not be conducted without serious burden.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 8-10, 13-18, 21-33, 36-42, and 45-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Thorsteinson et al.

Thorsteinson et al. (US 5,187,140) discloses a catalyst composition useful in the epoxidation of ethylene to ethylene oxide. The catalyst composition comprises a support and silver as the active metal (column 6, lines 24-30). The catalyst contains a high concentration of silver in the range of from about 25-45 percent by weight (column 6, lines 51-58). The silver is supported on a carrier having a BET surface area in the

Art Unit: 1725

range of from about $0.7 \text{ m}^2/\text{g}$ to about $10 \text{ m}^2/\text{g}$ (column 7, lines 55-60). Preferred carriers include alpha alumina (column 8, lines 5-20).

The catalyst further contains at least one or more promoters in an amount sufficient to enhance the efficiency and/or activity of the catalyst (column 11, lines 25-30). Preferred promoters include halides, e.g. fluorides and chlorides, and the oxyanions of the elements other than oxygen having an atomic number of 5-83 of groups 3b-7b and 3a-7a of the Periodic Table (column 11, lines 32-38). Preferred promoters include oxyanions of nitrogen, sulfur, manganese, tantalum, molybdenum, tungsten, and rhenium (column 11, lines 38-40). The catalyst contains alkali metal and/or alkaline earth metals as the cationic promoter (column 11, lines 49-50). Suitable examples include lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium and barium (column 11, lines 50-55). The concentration of promoters may vary from 0.0005-1 weight percent and preferably lies in the range of 10-4000ppm (column 12, lines 12-35).

Thorsteinson et al. does not specifically disclose that the carrier has a sodium solubilization rate of no greater than 5ppmw/5 minutes. However, the reference teaches that it is important to remove ions that may affect the performance of the catalyst (column 15, lines 20-30). Further, Thorsteinson et al. teaches a carrier "AJ" which is an alpha alumina carrier which is washed according to the following procedure: 30 minutes in boiling water, 6 times washed at 25 degrees C, each times 1000 cc carrier is washed with 1200 cc water, and dried at 300 degrees C (column 46, lines 5-11). The carrier has 51ppm of leachable sodium impurities (column 46, lines 14-20). Given the low

Art Unit: 1725

concentration of leachable sodium, it is considered that the treatment will inherently result in the solubilization rate that is instantly claimed. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Thorsteinson et al.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-7, 19-20, 34-35, and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thorsteinson et al. as applied to claims 1-5, 8-10, 13-18, 21-33, 36-42, and 45-49 above, and further in view of Matusz et al.

The teachings of Thorsteinson et al. are applied as above for claims 1-5, 8-10, 13-18, 21-33, 36-42, and 45-49.

The reference differs from the instant claims in that Thorsteinson et al. does not teach the use of rare earth or group VIII metals as promoters.

Matusz (US 5,739,075) discloses silver a catalyst useful for the production of ethylene oxide from ethylene. The catalyst comprises silver and promoter metals, including a rare earth metal, a metal selected from the group of alkaline earth metals, group VIII metals, and mixtures thereof, rhenium and/or sulfur, molybdenum, tungsten, chromium, phosphorus, boron, and mixtures thereof (column 2, lines 13-28). The catalyst is supported on alpha-alumina (column 4, lines 30-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Thorsteinson et al. to include the additional promoters taught by Matusz. The group of metals taught by Matusz includes promoters taught by Thorsteinson et al. which suggests that they are functionally equivalent. Because of the art recognized functional equivalence of the promoters taught by Thorsteinson et al. to the promoters taught by Matusz in the production of ethylene oxide from ethylene, it would have been obvious to one of ordinary skill to have substituted one known component for the other in the catalyst taught by Thorsteinson et al.

6. Claims 1-6, 9-19, 22-34, 37-43, and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finch et al. in view of Notermann et al.

Finch et al. (US 2,424,083) discloses a silver catalyst useful for the direct catalytic oxidation of olefins to olefin oxides. The catalyst comprises silver on a support which is preferably alumina (column 3, lines 35-40). The catalyst may further comprise promoters including gold, copper, platinum, nickel, iron, alkali metals, and alkaline earth metals (column 4, lines 30-45). The metals are deposited by impregnation in a solution

Art Unit: 1725

comprising a suitable silver salt, an alkali metal hydroxide, such as NaOH, ammonium hydroxide, and a reducing agent (column 5, lines 1-10). The alkali metal hydroxide is a basic compound which is considered to lower the hydrogen ion activity of the impregnating solution.

The amount of silver deposited is 0.5-2 g per 100 cm³ of catalyst (column 3, lines 15-20). The amount of promoter deposited may be prepared by adding the desired or optimum quantity, i.e. up to 8% of the amount of silver deposited (column 4, lines 45-50). It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215.

Finch et al. does not disclose that the support is treated such that the sodium solubilization rate is no greater than 5 ppmw per 5 minutes.

Notermann et al. (US 4,994,587) discloses a catalytic system for epoxidation of alkenes. The catalyst comprises silver on a solid support (column 11, lines 55-60). The support has less than about 50 and most frequently less than about 20ppm of leachable sodium (column 11, lines 60-63). A preferred support material is alpha alumina (column 13, lines 1-2).

Notermann et al. teaches that improved results are obtained by using a support wherein the support contains low levels of leachable sodium (column 13, lines 28-35). Notermann et al. teaches that the presence of leachable sodium exhibits deactivating

Art Unit: 1725

and effective life-shortening effects on the catalytic system (column 11, lines 18-25).

The low sodium support can be prepared by any methods suitable for removing sodium from a solid (column 13, lines 40-45). Typically the techniques involve extraction and/or volatilization of the sodium present (column 13, lines 50-68). Prepared supports have BET surface areas of $1.56 \text{ m}^2/\text{g}$ (column 23, Example 1).

Notermann et al. does not specifically disclose that the sodium solubilization rate of the carrier is no greater than 5 ppmw/5 minutes. However, it is considered that because Notermann et al. teaches removing leachable sodium from the carrier material, the resulting material will have the solubilization rate instantly claimed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the carrier taught by Finch et al. with the carrier taught by Notermann et al. One of ordinary skill would have been motivated to do so in light of the suggestion of Notermann et al. that the use the low sodium alumina carrier will obtain a catalyst with improved properties and avoid the deleterious effects of leachable sodium. Since both catalysts can be used to convert ethylene to ethylene oxide, one would have reasonable expectation of success from the combination.

7. Claims 7-8, 20-21, 35-36, and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finch et al. in view of Notermann et al. as applied to claims 1-6, 9-19, 22-34, 37-43, and 46-49 above, and further in view of Matusz.

The modified disclosure of Finch et al. is applied as above for claims 1-6, 9-19, 22-34, 37-43, and 46-49.

Art Unit: 1725

The reference differs from the instant claims in that the modified disclosure of Finch et al. further does not teach the use of rare earth or rhenium metals as promoters.

Matusz (US 5,739,075) discloses silver a catalyst useful for the production of ethylene oxide from ethylene. The catalyst comprises silver and promoter metals, including a rare earth metal, a metal selected from the group of alkaline earth metals, group VIII metals, and mixtures thereof, rhenium and/or sulfur, molybdenum, tungsten, chromium, phosphorus, boron, and mixtures thereof (column 2, lines 13-28). The catalyst is supported on alpha-alumina (column 4, lines 30-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the invention of Finch et al. to include the additional promoters taught by Matusz. The group of metals taught by Matusz includes promoters taught by Finch et al. which suggests that they are functionally equivalent. Because of the art recognized functional equivalence of the promoters taught by Finch et al. to the promoters taught by Matusz in the production of ethylene oxide from ethylene, it would have been obvious to one of ordinary skill to have substituted one known component for the other in the catalyst taught by Finch et al.

Response to Arguments

8. Applicant's arguments filed 4/23/03 have been fully considered but they are not persuasive.

With regards to the various rejections under 35 USC 102(b) and 35 USC 103(a) over Thornsteinson, applicant argues that the Examiner has not established a prima facie case of anticipation necessary to shift the burden to applicant with regards to the

Art Unit: 1725

sodium solubilization rate. The examiner disagrees. Thornsteinson teaches that leachable impurities that are present in the carrier should be removed. The reference specifically details the preparation of a carrier that contains only 51 ppm of leachable sodium following a washing procedure. It is noted that the instant claims detail that the sodium is removed by washing. Therefore, it is considered that, given the low level of leachable sodium in the carrier and the treatment described by the reference, the carrier would inherently possess a sodium solubilization rate as recited in the instant claims. The examiner submits that the evidence described above is sufficient to shift the burden to the applicant to establish that the characteristic is not inherent. Applicant has not met this burden.

With regards to the various rejections under 35 USC 103(a) over Finch et al. in view of Notermann, applicant argues that the Examiner has not established a prima facie case of anticipation necessary to shift the burden to applicant with regards to the sodium solubilization rate. The examiner disagrees. Notermann teaches that leachable impurities that are present in the carrier should be removed. The reference details that sodium may be removed by an extraction and/or volatilization procedure, as is recited in the instant claims. Therefore, it is considered that, given the low level of leachable sodium in the carrier and the treatment described by the reference, the carrier would inherently possess a sodium solubilization rate as recited in the instant claims. The examiner submits that the evidence described above is sufficient to shift the burden to the applicant to establish that the characteristic is not inherent. Applicant has not met this burden.

Art Unit: 1725

Applicant further argues that there is no motivation to combine the references. However, the secondary reference clearly teaches advantages associated with a low sodium level, providing one of ordinary skill with motivation to combine the references. Because both catalysts are used in the same process of using, one would have reasonable expectation of success from the combination.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (703) 305-0469. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for

Art Unit: 1725

the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

CAI
May 10, 2003



TOM DUNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700